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10/567,732

02/10/2006

Robert J T Bunyan

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EXAMINER

ROJAS, BERNARD

ART UNIT

PAPER NUMBER

2832

MAIL DATE

DELIVERY MODE

05/14/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|--------------------------------------|--------------------------------------|--|
| Office Action Summary | Application No. 10/567,732 | Applicant(s) BUNYAN ET AL. | |
| | Examiner BERNARD ROJAS | Art Unit 2832 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 February 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) 6 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 6 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

Newly submitted claim 6 directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: The newly claimed apparatus of claim 6 requires a dual method of actuation; both the piezoelectric and the electrostatic actuators are moved to actuate the armature to the closed position. Previous claims 1-5 used the piezoelectric actuator to cause a switching action [close the contacts] and the electrostatic electrode to hold/latch/clamp the contacts closed. This renders claim 6 a distinct from the one presented in claims 1-5.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claim 6 is withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein

were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mehta [US 7,215,064] in view of Schwartz et al. [US 7,053,737] and in further view of Hyman et al. [US 6504118].

Claim 1, Mehta discloses a micro electromechanical system switch including a fixed contact [120] and a moveable contact [119] on an armature [figure 2a] characterized by: piezoelectric material [110, 111] with associated electrodes [112,115] for bending the armature upon application of electric voltages and providing a piezoelectric switch operation [figures 2a and 2c]; the arrangement being such that operation of the piezoelectric material bends the armature towards the fixed contact and bends the moveable contact (35) into a substantially parallel alignment with the fixed contact [figure 2c].

Mehta fails to teach that the armature is bent away from the fixed contact when in a switch open condition with zero applied voltage.

Schwartz et al. discloses a micro-switch with a cantilever arm [130] that is bent away from a fixed substrate contact [114] when in a switch open condition with zero applied voltage.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to bend the ends of the body of Shirakawa et al. away from the substrate as shown by Schwartz et al. In order to maximize electrical isolation between the transmission line and the electrical contact in an OFF-state while maintaining a low actuation voltage, the actuator arm [body] is bent such that the minimum separation distance between the transmission line and the electrical contact is equal to or greater than the maximum separation distance between the substrate electrostatic [abs].

Mehta in view of Schwartz et al. fails to teach the use of electrodes to electrostatically latch the cantilever.

Hyman et al. teaches a piezoelectric switch [figure 6] with a set of electrodes [215, 242] associated with the movable contacts [237, 220] on the armature in order to latch the movable contact against fixed contacts [222, 239] in a closed position [figures 10b and 10c].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add electrodes to the switch of Mehta in view of Schwartz et al. in order to latch the cantilever in a closed/contact position in order to conserve power when keeping the contacts closed.

Claim 2, Mehta as modified discloses the claimed invention except for the type of signal being switched. It would have been obvious to one of ordinary skill in the art at the time the invention was made to switch different types of signals depending on the environment in which the switch is used.

Claim 3, Schwartz et al. discloses the switch of claim 2 wherein the moveable contact is a switch contact with at least two protuberances for connecting two electrically isolated parts of a signal line together [figure 3].

Claims 4 and 5, the method of providing a micro electromechanical system is inherent in the product structure as described for claims 1-3 above.

Response to Arguments

Applicant's arguments filed 02/11/2008 have been fully considered but they are not persuasive.

Applicant states that Schwartz discloses a different armature structure than that claimed by Applicant. In response, Mehta discloses the claimed armature structure, Schwartz is relied on as a teaching to bend the armature away from the substrate to increase the distance between the contacts.

Applicant states that Schwartz fails to disclose the same motivation for bending the armature away from the substrate. In response to applicant's argument that the armature is bent away from the substrate in order to solve the problem of sticking electrical contacts and the Schwartz reference bends the armature away from the substrate for a different reason, the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985).

Applicant states that the Examiner fails to provide a reason or motivation for combining the Hyman et al. reference with Mehta and Schwartz et al. As clearly stated in page 4 paragraph 2 of the Office action, *"It would have been obvious to one of ordinary skill in the art at the time the invention was made to add electrodes to the switch of Mehta in view of Schwartz et al. in order to latch the cantilever in a closed/contact position in order to conserve power when keeping the contacts closed."* As clearly stated, using latching electrodes to hold the armature in a closed position would require less power than providing continual power to the piezoelectric armature to hold it in the closed position.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to BERNARD ROJAS whose telephone number is (571)272-1998. The examiner can normally be reached on M and W-F, 5:30-3:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Elvin G. Enad can be reached on (571) 272-1990. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Elvin G Enad/
Supervisory Patent Examiner, Art Unit 2832

Br
/Bernard Rojas/
Examiner, Art Unit 2832